

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

November 9th, 1921.—Mr. R. D. Oldham, F.R.S.,
President, in the Chair.

The following communications were read:—

1. 'The Igneous and Associated Rocks of Llanwrtyd (Brecon).'
By Laurence Dudley Stamp, D.Sc., A.K.C., F.G.S., and Sidney
William Wooldridge.

PART I—STRATIGRAPHICAL (L. D. S.).

The igneous rocks of Llanwrtyd occupy the core of the Towy
Anticline of Central Wales for a distance of about 2 miles.
The succession proved is as follows:—

- [(7) Intrusion.]
(6) Black Slates, cleaved and poorly fossiliferous.
(5) The Upper Ashes { Fossiliferous ashy shales.
 { Fine banded ashes.
 { Coarse ashes.
(4) Hardened mudstones with a band of ashy limestone.
(3) The Spilites and Spilito-Breccias.
(2) Hardened sediments with fossiliferous mudstones.
(1) The Lower Ashes and Breccia.

The fossils from the lower horizon (2) include *Dicranograptus rectus* Hopkinson, *Glyptograptus teretiusculus* var. *siccatus* Elles & Wood, and *Climacograptus schürenbergi* Lapworth. Those from the higher horizon (5) include *Dicellograptus sextans* Hall and var. *exilis* Elles & Wood, and *Glyptograptus teretiusculus* var. *siccatus* Elles & Wood. Both assemblages are characteristic of the *Dicranograptus* Shales of South Wales, especially of the horizon of the Mydrim Limestone. The volcanic rocks of Llanwrtyd are therefore of lowest Bala (Survey classification) or highest Llandeilo (classification of Miss G. L. Elles) age, and on the same horizon as the Upper Basic and Upper Acid Series of Cader Idris. It had previously been suggested that the Llanwrtyd rocks were of the same age as those at Bulth, 10 miles away, which are Llanvirnian.

A detailed description of the beds is given, as well as an account of the more important sections, and a comparison with other parts of Wales. The igneous rocks are cut off on the west by a fault, into which an intrusive mass appears to have been forced.

2. 'The Base of the Devonian, with especial reference to the Welsh Borderland.' By Laurence Dudley Stamp, D.Sc., A.K.C., F.G.S.

This paper is an attempt to establish a satisfactory base for the Devonian System, on a basis which shall serve for international correlation. The classification adopted is as follows:—

LOWER DEVONIAN (OLD RED SANDSTONE FACIES.)	{	II. Dittonian. I. Downtonian.
SILURIAN (GOTLANDIAN).....	{	III. Ludlovian. II. Wenlockian. I. Valentian.

Murchison, in defining the Silurian System, drew the limit between it and the Old Red Sandstone below the Downton Castle Sandstone or Tilestones. He afterwards included the latter in the Silurian, and later writers have grouped still higher beds as Silurian. It is proposed to return to the original definition of Murchison. The Ludlow Bone-bed forms a natural base: it consists of fish-remains, all of which first appear at this horizon, and are genetically connected with higher Devonian faunas; it passes laterally into a conglomerate, and thus forms a natural physical base; it marks a palaeontological and lithological break which can be correlated all over North-Western Europe. Typical sections are described in detail.

A study of the palaeontology of the Downtonian of the Welsh Borderland shows that the fauna of the lower beds (Ludlow Bone-bed, Downton-Castle Sandstone, and *Platyschisma* Shales) falls into three groups:—

(a) Upper Ludlovian marine species which survived the change of conditions indicated by the bone-bed, and lived on in diminished numbers, but gradually die out. The *Platyschisma* Shales of Clun Forest are of deeper-water type than the Downton-Castle Sandstone, and still other marine forms occur.

(b) Species which flourished for a short time under the changing conditions.

(c) New forms—chiefly fishes—which persist, or are closely connected with later Devonian forms.

A comparison is made between the succession in the Welsh Borderland and various other regions:—Scotland, Devon and Cornwall, Northern France, the Ardennes, Brittany, Portugal, the Baltic lands, Spitsbergen, and North America.

Some notes on the Downtonian palaeogeography of England are added, and some remarks on the habitat of Devonian fishes. It is suggested, from the association of the early Downtonian fishes with marine invertebrates that they could live in either salt or brackish water, but gradually became specialized—some for a lacustrine habitat, others, perhaps, for marine conditions.